KOCHARLI, K. Sh.

Studying the electric conductivity of Baku petroleum oils [in Azerbaijani with summary in Russian]. Uch. zap. AGU no.4:29-34 '57. (MIRA 11:1)

(Baku--Petroleum products) (Electric conductivity)
(Lubrication and lubricants)

KOCHARLI, K.SH.

82050

5.4600(A) S/058/60/000/03/08/030

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 3, p. 142, # 5955

AUTHORS: Kocharli, K. Sh., Pashayev, T. N.

TITLE: On the Dielectric Properties of Polymers

PERIODICAL: Uch. zap. Azerb. un-t. Fiz.-matem. i khim. ser., 1959, No. 2, pp. 59-64 (Azerbaydzhanian; Russian summary)

TEXT: The results from experimental investigations of the dielectric properties of 10 polymers of isobutylene and isoamylene were presented. The dielectrical constant ε and the tangent of dielectrical loss angle tg δ were measured with the aid of a Q-meter within the frequency range of 1.5-12 Mc, and the electric conductivity σ was measured by a special galvanometric device. All measurements were carried out within the temperature range from 20 to 125°C. As a result of the investigation the following preliminary conclusions can be drawn. 1. The polymers of isobutylene and isoamylene are basically nonpolar polymers. Only the I and II polymers of isoamylene can be considered as weakly polar polymers. 2. ε of the polymers of isobutylene and isoamylene, in the case of low-frequency, does not depend on the frequencies. 3. tg δ for some polymers

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B2050

S/058/60/000/03/08/030

On the Dielectric Properties of Polymers

of isobutylene and isoamylene in the frequency range of 5-10 Mc is inversely proportional to the frequency. 4. The dependence of ε' on the temperature for the given polymers obeys the exponential law $\varepsilon = \varepsilon_0 \exp(-a_1/T)$. Thus ε' decreases with an increase in the polymerization degree. In the semi-logarithmic coordinate system the curves $\lg Q = f(t)$ are a converging bundle of straight lines. The temperature pertaining to the point of intersection is 122°C.

Author's summary

Card 2/2

ZEYNALLY, A.kh.; KOCHARLI, K.Sh.; KHALILOV, P.A.

Apparatus for studying the photoeffect. Uch. zap. AGU. Ser. fiz.-mat. i khim. nauk no.4:99-104 '61. (MIRA 16:6)
(Photoelectricity)

EWT(1)/EDS--AFFTC/ASD/ESD-3--IJP(C)
L 10061-63
ACCESSION NR: AR3000360 S/0058/63/000/004/E052/E052

56

SOURCE: RZh. Fizika, Abs. 4E349

AUTHOR: Kocharli, K. Sh.; Dzanov, L. M.

TITLE: Investigation of the dielectric properties of the system n Sb sub 2 Se sub 3, n Sb sub 2 S sub 3

CITED SOURCE: Uch. zap. Azerb. un-t. Ser. fiz.-matem. i khim. n., no. 6, 1961, 49-53

TOPIC TAGS: antimony-selenium alloys, dielectric properties, temperature dependence

TRANSLATION: The temperature and frequency dependences of the dielectric constant (Epsilon) and the tangent of the dielectric loss angle (tg Delta) of the following systems were investigated: 25% Sb sub 2 Se sub 3. 75% Sb sub 2 S sub 3 (One), 50% Sb sub 2 Se sub 3. 50% Sb sub 2 S sub 3 (Two), and 75% Sb sub 2 Se sub 3. 25% Sb sub 2 S sub 3 (Three). The investigations were carried out at

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L 10041-63
ACCESSION NR: AR3000360

0

frequencies 0.5-20 Mcs in the temperature range 20-110° C on specimens pressed at a pressure of 200 kg. per square centimeter. The values of Epsilon of systems One and Two do not depend on the frequency and are equal to 18.55 and 11.83 respectively; the frequency variation of tg Delta indicates that the losses have an ohmic character. With increasing temperature the losses increase; the temperature dependence of tg Delta shows a relaxation maximum which, in the case of system Two is masked by the ohmic losses, and in the case of the system Three is clearly pronounced. The relaxator activation energy calculated from the frequency shift of the temperature peak of the losses of system Three is equal to 0.41 ev. The nature of the relaxator is not made clear. V. Lozovskiy

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH

cs/ja
Card 2/2

S/058/63/000/002/047/070
A160/A101

AUTHORS: Bezdetnyy, N. M., Kocharli, K. Sh., Zeynally, A. Kh.

TITLE: An investigation of some photoelectric properties of silicon single crystals with the help of the microradiowave technique

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1963, 77, abstract 2E521 ("Uch. zap. Azerb. un-t. Ser. fiz.-matem. i khim. n.", no. 4, 1961, 89 - 93)

TEXT: By the method of radio wave absorption in the frequency range of 8.6 ÷ 9.6 kilo-megahertz, an investigation was carried out of the spectral and luxampere characteristic of the natural photoconductivity (for a light with a wavelength of 0.2 to 1.2 μ) in a n - Si single crystal with a specific resistance of 40 ohm·cm and a carriers life time of 40 - 60 μsec at room temperature. It was established that the luxampere characteristics are linear for a light with a wavelength of 1.0, 1.1 and 1.15 μ. The authors explain that this is due to the high dark concentration of free carriers in comparison to the concentrations of recombination centers. It was established that the maximum of the spectral

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An investigation of some...

S/058/63/000/002/047/070
A160/A101

characteristic of the natural photoconductivity of the monocrystalline Si is to be found at a wavelength of 1.1 μ.

Yu. Ukhanov

[Abstracter's note: Complete translation]

Card 2/2

L 59624-65 EWT(1)/T/EWA(h) Pz-6/Pab EJP(c) AT
ACCESSION NR: AT5018032 UR/0033/63/000/002/0083/0087

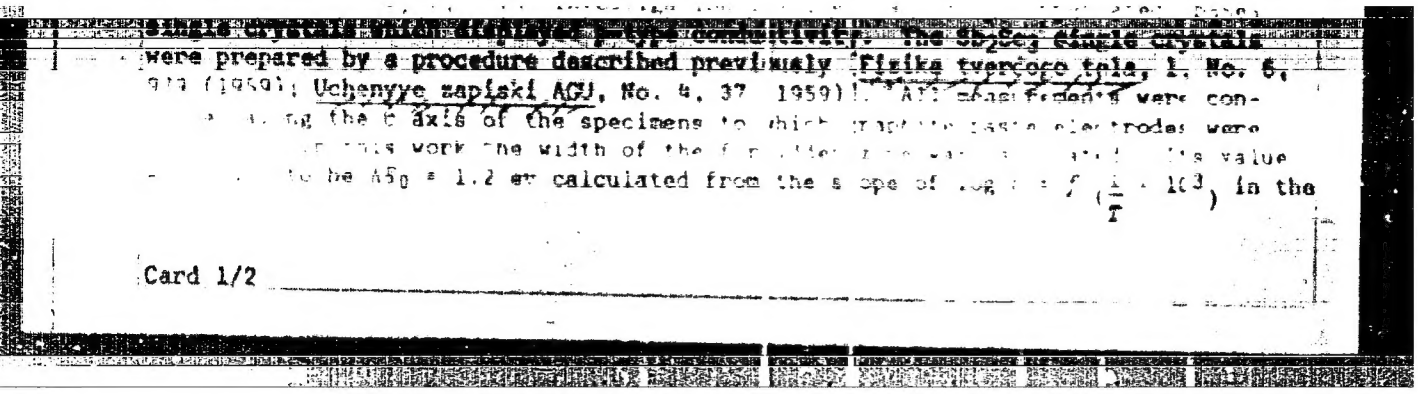
AUTHOR: Kocharli, K. Sh.; Zeynally, A. Kh.; Beler'kiy, G. L. 35 B+1

TITLE: The energy structure of antimony selenide

SOURCE: Baku. Azerbaydzhanskiy gosudarstvennyy universitet. Uchenyye zapiski. [illegible] matematicheskikh nauk, no. 2, 1963.

TOPIC TAGS: antimony selenide, semiconductor, activation energy, activated crystal, [illegible] conductivity

ABSTRACT: The purpose of this article was to investigate the energy spectra of dislocation states in Sb_2Se_3. The investigation involved partially compensated Sb_2Se_3 [illegible] which displayed p-type conductivity. The [illegible] single crystals



single crystals with displayed p-type conductivity. The Sb_2Se_3 single crystals were prepared by a procedure described previously [Fizika tverdogo tela, 1, No. 6, 973 (1959); Uchenyye zapiski AGU, No. 4, 37 1959]. [illegible] were conducting the c axis of the specimens to which [illegible] electrodes were [illegible] this work the width of the [illegible] value to be $\Delta E_g = 1.2$ ev calculated from the slope of $\log \rho = f\left(\frac{1}{T} \cdot 10^3\right)$ in the

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natural conductivity region. The impurity levels with the following activation energy levels were determined:

$$E_1 = 0.017 \text{ ev}, E_2 = 0.18 \text{ ev}, E_3 = 0.3 \text{ ev}, E_4 = 0.53 \text{ ev}.$$

The calculated capture cross section for the level 4, which is considered to be the principal recombination level, was found to be $S = 3 \cdot 10^{-18}$ cm^2. Orig. art. has: 4 figures.

6 figures.

ASSOCIATION: Azerbaydzhanskiy gosudarstvennyy universitet (Azerbaydzhan State University)

SUBMITTED: 00Mar63 ENCL: 00 SUB CODE: SS

NO REF SOV: 006 OTHER: 001

Card 2/2

L 17155-65 EWT(m)/EWP(t)/EWP(b) Pa-4 IJP(c)/ASD(a)-5/AFMD(t)/AS(mp)-2/
ESD(gs)/ESD(t)/ESD(dp) RDW/JD

ACCESSION NR: AR4049288 t/0081 '64/000/015/N024/N024

SOURCE: Ref. zh. Khimiya, Abs. 15B154

AUTHOR: Kocharli, K., Sultanova, R.

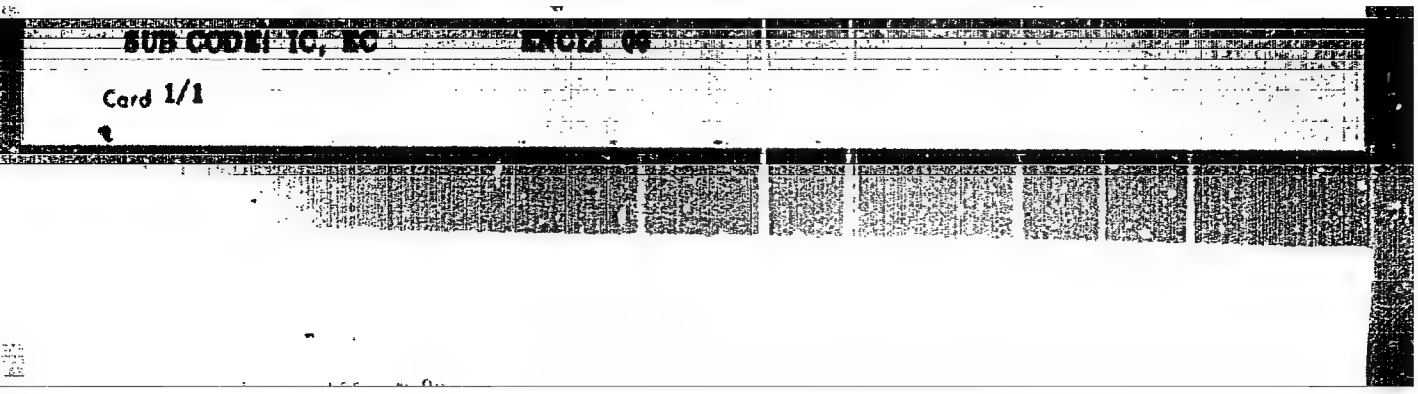
TITLE: A study of the dependence of the dielectric constant on temperature and frequency in arsenic sulfide and selenide

TITLE: A study of the dependence of the dielectric constant on temperature and frequency in arsenic sulfide and selenide

CITED SOURCE: Uch. zap. Azerb. un-t, Ser. fiz.-matem. n., no. 4, 1963, 91-93

TOPIC TAGS: arsenic selenide, dielectric constant, arsenic sulfide, dielectric constant measurement

TRANSLATION: The authors measured the dependence of the dielectric constant ε in As_2Se_3 and As_2S_3 on frequency and temperature. In As_2Se_3 ($\varepsilon \approx 6.2$) and does not depend on frequency at room temperature (for 1 to 20 Mc). It increases from 6.2 to 9.1 as the temperature rises from 25 to 150C. For the range from 50 kc to 20 Mc, $\varepsilon \approx 6.4$ is nearly independent of frequency at room temperature. The maximal value of



ISMAYLOV, K.A.; KOCHARLI, Sh.S.

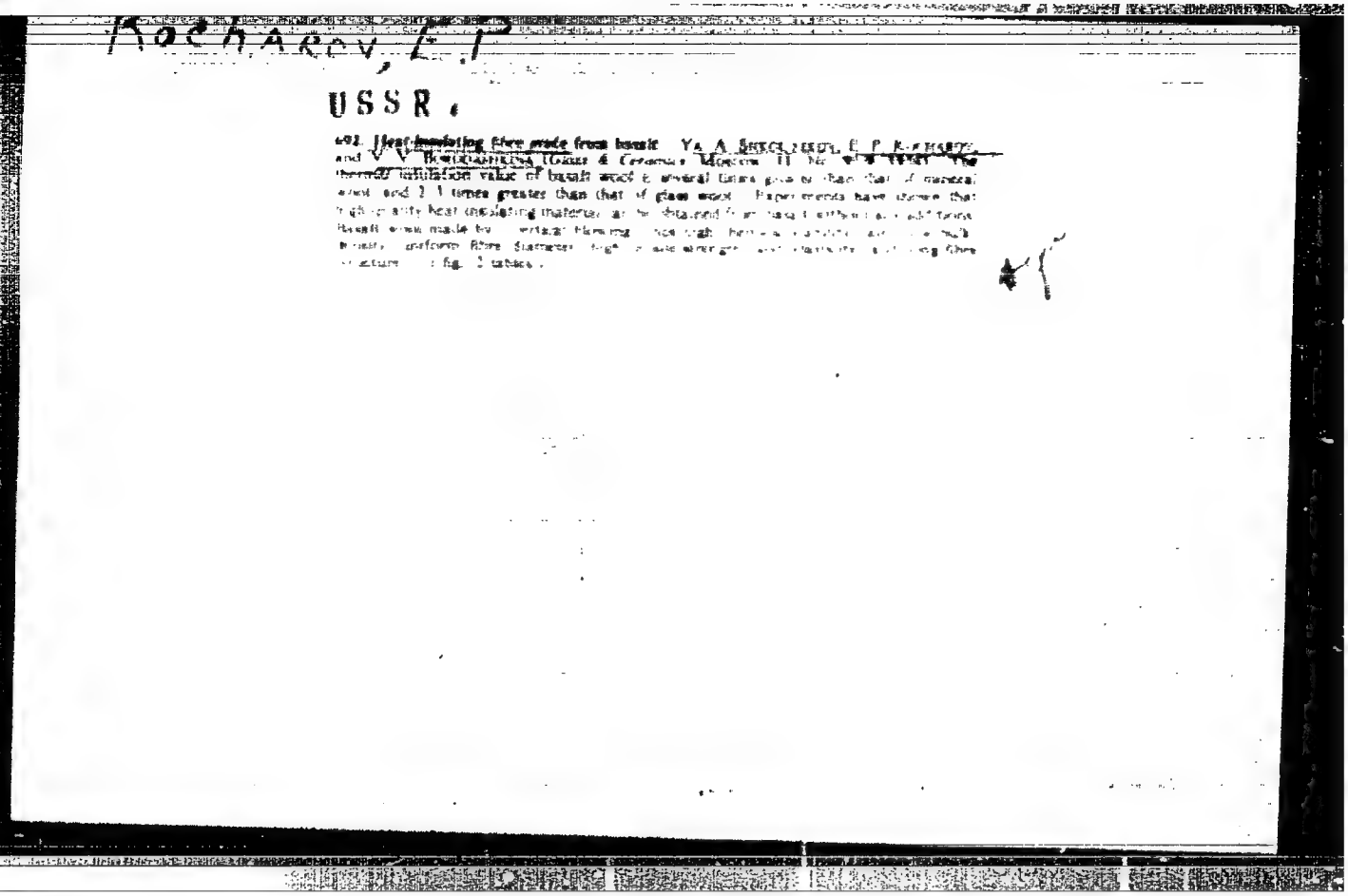
Role of the paleontological factor in oil and gas formation in the lower part of the Kura Lowland. Geol. nefti i gaza 9 no.8:1-5 Ag '65. (MIRA 18:8)

1. Institut geologii AN AzerSSR.

KOCHAROV, E. P.; BORODASHKINA, V. V.; SHKOL'NIKOV, Ya. A.

"Heat Insulating Fibers from Basalt," Steklo i Keramika, 2, No. 9, pp 9-12, 1954.

Translation M-701, 19 Aug 55



Rocharov, E. P.

USSR

[illegible] Heat-insulating fibre made from basalt Ya. A. [illegible], E. P. Rocharov, and V. V. [illegible] (Glass & Ceramics, Moscow, [illegible]) [illegible] thermal insulation value of basalt wool is several times greater than that of mineral wool and 2.1 times greater than that of glass wool. Experiments have shown that [illegible] heat-insulating materials [illegible] basalt fibre [illegible] basalt wool made by [illegible] method. [illegible] uniform fibre diameter [illegible] structure [illegible] fig. 2 tables.

SHKOL'NIKOV, Ya.A., kand. tekhn. nauk; KOCHAROV, M.P., insh.

Efficient methods for obtaining high-quality mineral-wool heat and sound insulating products. Strol. mat. 5 no.6:7-10 Je '59. (MIRA 12:8)

(Insulating materials) (Mineral wool)

S/072/60/000/009/001/007
B021/B058

AUTHORS: Shkol'nikov, Ya. A., Kocharov, E. P.

TITLE: The Manufacture of Heat- and Sound-insulating Materials From Glass Staple Fiber Must Be Expanded

PERIODICAL: Steklo i keramika, 1960, No. 9, pp. 1-5

TEXT: The experimental technological production line for the production of glass fibers by means of the vertical steam-blowing method and for processing the fiber into heat- and sound-insulating materials is to be considered the technical basis of the development envisaged in the Seven-year Plan. The scheme of such a production line installed at the Merefyanskiy stekol'nyy zavod (Merefa Glassworks) is shown in Fig. 1. The glass mass leaving a spinneret forms staple fibers under the action of superheated flowing steam. A production line for processing the glass staple fiber into finished products was built by the mashinostroitel'nyy zavod imeni Karla Marksa (Machine-building Factory imeni Karl Marx). Experiments at the Institut steklovolokna (Institute for Glass Fiber) showed that it is preferable to use a shuttle-type, electrically heated

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The Manufacture of Heat- and Sound-insulating Materials From Glass Staple Fiber Must Be Expanded

S/072/60/000/009/001/007
B021/B058

spinneret instead of a platelike one (Fig. 2). The steam nozzle of the type ТВЦ (TVTs) (Fig. 3) was also developed. The resin acting as binding agent is introduced by means of atomizers. The formation of rigid plates in the drying- and polymerization chamber is shown in Fig. 4. The Institute for Glass Fiber jointly with the design office of the Factory imeni Karl Marx and the institut Giprostroyindustriya (State Institute for the Design and Planning of Establishments of the Construction Industry) are conducting experiments for the purpose of establishing a plant for the automatic pasting-on of fabrics. The fabric is pasted on by means of phenol-formaldehyde resin. The fiber is produced from glass No. 28, as developed by the fiziko-khimicheskaya laboratoriya (Physico-chemical Laboratory) of the Institute for Glass Fiber. The temperature dependence of the viscosity of glasses of varying composition is shown in Fig. 5. Synthetic phenol-formaldehyde resins of the types Б (B), СП-2 (SP-2), ВР-1 (VR-1) as well as urea formaldehyde of the type МФ-17 (MF-17) are used as binding agents for the manufacture of plates. The output of a plant averages 3 t daily. The zavod imeni Likhachova (Plant imeni Likhachev) (household refrigerators) and the shipbuilding in-

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The Manufacture of Heat- and Sound-insulating Materials From Glass Staple Fiber Must Be Expanded

S/072/60/000/009/001/007
B021/B058

dustry are indicated as being the main consumers of these products. The Giprosteklo Institute and the State Institute for the Design and Planning of Establishments of the Construction Industry elaborated typified projects of plants with an annual output of 50,000 and 100,000 m^3 of products, the first of which are to be taken into operation in 1961. Heat- and sound-insulating products made of staple fiber should be manufactured by glassworks situated close to consumer areas, owing to the difficultly of their transportation. There are 5 figures.

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S/072/60/000/008/007/007/XX
B021/B054

AUTHOR: Kocharov, E. P.

TITLE: News About East-German Glass Fiber Production

PERIODICAL: Steklo i keramika, 1960, 17, No. 8, pp. 40 - 44

TEXT: The following glass fiber products are mentioned: Glass-reinforced plastics in sheets: Glakresit: An aqueous starch solution is sprayed on the glass fabric, and dried in a drying chamber at 90-110°C. Further, resin and plaster are applied to the glass fabric on an assembly line. The resulting glass-reinforced sheet plastics are sorted, and sawn to required dimensions. The finished sheets consist of 40% glass fiber, 45% resin, and 15% plaster. The specific gravity of Glakresit is 0.95-1.2 g/cm^3, the bending strength at 2 mm thickness is 890 kg/cm^2, the tearing strength is 200-500 kg/cm^2, the impact strength 9.50 kg·cm/cm^2, and the elasticity modulus E = 5,000-6,000 kg/cm^2. Glass mats are produced on an assembly line. Glass

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88230

News About East-German Glass Fiber Production

S/072/60/000/008/007/007/XX
B021/B054

fiber fabrics are treated with polyvinyl acetate emulsion, and dried. The tearing strength of glass mats in the longitudinal direction at 50 mm width and 1 mm thickness is 15 kg. The capacity of an assembly line is 5,000 m^2 a day. An experimental plant for the production of glass fiber semirayon comprises a melting device for glass rods, and two centrifuges. The yarn consists of 50% long fibers and 50% staple fibers. Semirayon can be used for the production of incombustible decoration material, heat and electric insulating material, and acid-resisting filters. Further, the author briefly describes an experimental plant for the production of textile fibers from glass rods. The fiber diameter is 9μ, the capacity of the plant 3 kg per 8 hours. Electroinsulating fabrics were made of this fiber. The production of textile fibers by mechanical drawing from spinnerets is carried out by means of platinum rhodium glass melting crucibles having 100, 200, and 250 spinnerets 1.6 mm in diameter. An experimental plant for the production of superfine fibers (3μ) operates with glowing gases by which the molten glass is blown into threads. Superfine fiber products can be used as filters. Experimental plants for the production of staple fibers

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News About East-German Glass Fiber Production

S/072/60/000/008/007/007/XX
B021/B054

for heat insulation operate by means of fiber stretching by a vapor current. The fiber is 14-15μ thick. The plant consists of an electric furnace with platinum rhodium crucible for glass melting, a blowing device, a fiber-forming chamber, a suction chamber, and an assembly line. There are 5 figures.

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S/026/62/000/003/006/006
D055/D113

AUTHOR: Kocharov, E.P.

TITLE: New heat-insulation

PERIODICAL: Priroda, no. 3, 1962, 109-111

TEXT: The author describes the uses of glass fiber as an insulating material, its advantages over other insulators and its method of production in the USSR. In the USSR glass fiber is produced by a method developed at the Institut steklovolokna (Institute of Glass Fiber) by a group of scientists headed by Ya.A. Shkol'nikov. The uniform glass mass enters a feeder in the front part of the furnace. It passes through a spinneret in the form of a platinum plate heated by electric current in the bottom of the feeder. The threads of molten glass leaving the spinneret are exposed to a powerful current of superheated steam or compressed air which separates and accelerates smaller threads from the main one. Thanks to the viscous properties of the glass mass they do not become detached from the main

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New heat-insulation

thread and in motion form thin glass fibers. These then enter a vertical chamber where they are impregnated by a spray of synthetic resin. The layer of fiber then enters a conveyor unit where it is condensed, the resin - polymerized and the material glued to backing. There are 6 figures.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut steklyannogo volokna(Moskva) (All-Union Scientific Research Institute for Glass Fiber (Moscow).

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43316

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S/026/62/000/012/004/007
D036/D114

AUTHOR: Kocharov, E.P.

TITLE: Ultrafine glass fiber

PERIODICAL: Priroda, no. 12, 1962, 94-95

TEXT: The properties and applications of ultrafine glass fiber are described. This fiber is 0.4-1.0 μ in diameter, has a volumetric weight of about 5 kg/m³, and a sound-absorption factor of 0.9 for 512 cps sound. It has the lowest heat conduction factor of all heat-insulating materials, is noninflammable, chemically stable anddoes not shrink under vibration. It can be used to make wool which can filter out particles one millionth of a millimeter in diameter (radioactive aerosols, etc.). Such wool can be also used to make 20-25-μ-thick glass paper for insulating electrical equipment. The fiber is produced by a technique developed by Ya.A. Shkol'-nikov, B.M. Polik, N.G. Karakhanidi, P.K. Ivanov and others of the author's institute. In this technique, 100-200 μ primary glass fibers are drawn out of an electric platinum-rhodium glass-melting furnace into a high-velocity

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Ultrafine glass fiber

S/026/62/000/012/004/007
D036/D114

high-temperature stream of incandescent gases which breaks them down into separate elements which are then drawn into very thin, short, fibers. These fibers are precipitated onto a metal grid in the form of fabric which is impregnated with synthetic resin and fed into a drying and polymerization chamber. Thin aluminum foil or an organic film is then stuck on to the mats, whose volumetric weight is between 7 and 12 kg/m^3.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut steklyannogo volokna (All-Union Scientific Research Institute of Glass Fibers), Moscow

Card 2/2

KOCHAROV, E.P., insh.; SHKOL'NIKOV, Ya.A., kand.tekhn.nauk

Heat-insulating shells made of glass staple fiber. Stroi.mat. 8 no.7:18-20 Jl '62. (MIRA 15:8)
(Insulation (Heat)) (Glass fibers)

KOCHAROV, E.P.

New thermoisolation. Priroda 51 no.3:109-111 Mr '62.
(MIRA 15:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut steklyannogo volokna, Moskva.

(Glass fibers)

KOCHAROV, E.P.

Ultrafine glass fiber. Priroda 51 no.12:94-95 D '62.
(MIRA 15:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut steklyannogo volokna, Moskva.
(Glass fibers)

SHKOL'NIKOV, Ya.A., kand.tekhn.nauk; KOCHAROV, E.P., inzh.

"Fiberglass building materials" by T.M.Barbarina, M.P.Sukhov, M.A.Sheludiakov. Reviewed by Ia.A.Shkol'nikov, E.P.Kocharov. Stek.i ker. 19 no.11:48 N '62. (MIRA 15:12)
(Glass fibers) (Building materials)
(Barbarina, T.M.) (Sukhov, M.P.) (Sheludiakov, M.A.)

BARBARINA, T.M.; BUBYR', N.F.; BUTT, L.M.; VIL'GOVSKIY, V.N.; GORLOV, Yu.P.; GRIBANOVSKIY, V.G.; DROZDOV, I.Ya.; YEREMIN, I.A.; ZEZIN, V.G.; KEVESH, P.D.; KOCHAROV, E.P.; KOSYREVA, Z.S.; LEVIN, S.N.; MAKHNOVICH, A.T.; MERZLYAK, A.N.; RODOV, E.S.; ROZHNOV, A.I.; SEREBRYANSKAYA, B.I.; SUKHAREV, M.F.; USTENKO, A.A.; KHOMENKO, Z.S.; SHMIDT, L.M.; ETIN, A.O.; YAKHONTOVA, N.Ye.; KITAYTSEV, Vladimir Andreyevich, prof., doktor tekhn. nauk, red.; SKRAMTAYEV, B.G., glav. red.; TROKHIMOVSKAYA, I.P., zam. glav. red.; KRAVCHENKO, I.V., red.; KITAYGORODSKIY, I.I., red.; KRZHEMINSKIY, S.A., red.; ROKHVARGER, Ye.L., red.; BALAT'YEV, P.K. red.

[Manual on the manufacture of heat insulating and acoustical materials] Spravochnik po proizvodstvu teploizoliatsionnykh i akusticheskikh materialov. Moskva, Stroiizdat, 1964. 524 p. (MIRA 18:1)

KOCHAROV, E.V.

Simplified formula for calculating gathering networks.
Neft.khoz. 41 no. 12:45-48 D '63. (MIRA 17:6)

Kocharov, G.Ye

120-6-16/36

AUTHORS: Bochagov, B.A., Kocharov, G.Ye., and Kirshin, G.P.

TITLE: An Improvement in the Energy Resolution of the Ionisation Chamber with a Grid (Uluchsheniye razreshayushchey sposobnosti po energii impul'snoy ionizatsionnoy kamery s setkoy)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.6, pp. 72 - 74 (USSR)

ABSTRACT: The main factors are considered which have an effect on the energy resolution of an ionisation chamber containing a grid. As is known, the presence of even a small impurity of gases such as oxygen, water vapour, etc. considerably worsen the energy resolution. To clean up the gas a sodium "filter" was used. The clean-up took about 2 to 3 hours. By a suitable choice of the first valve of the amplifier, and by suitable matching, the RMS value of the noise was reduced to 6.8 keV, which is less by 3.2 keV than that quoted in Ref.4. It is shown that the Soviet valve 6Ж1П has better noise properties than the American valve 6AK5. The signal-to-noise ratio depends on the pass band of the amplifier as well as the characteristics of the first valve. To obtain a maximum signal-to-noise ratio, it is necessary to use valves having a small grid current as well as very curved characteristics. The energy spectrum of

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Kocharov, G. Ye.

USSR/Nuclear Physics - Structure and Properties of Nuclei C-4

Abs Jour : Ref Zhur- Fizika, No 1, 1958, 473

Author : Bachagov, B.A., Komar, A.P.; Kocharov, G.Ye.

Inst : Leningrad Physical-Technical Institute, Academy of Sciences, USSR.

Title : Fine Structure of α Spectra of U^{234} and U^{238}.

Orig Pub : Zh. eksperim. i teor. fiziki, 1957, 32, No 5, 1257-1259

Abstract : A study was made of the energy spectrum of α particles from U^{234} and U^{238} with the aid of a pulsed ionization chamber, having a high transmission and improved resolution. The source employed was a natural mixture of uranium isotopes. The spectra obtained in both cases have shown clearly the additional presence of a group of α particles corresponding to the transition to the first rotational level of the daughter nucleus, along with the

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USSR/Nuclear Physics - Structure and Properties of Nuclei C-4

Abs Jour : Ref Zhur- Fizika, No 1, 1958, 473

fundamental group of α particles. The energy of the fundamental line and the line of the fine structure are respectively 4.77 and 4.72 Mev for U^{234} and 4.18 and 4.135 Mev for U^{238}. The intensities of the lines amount to 72 and 28% in the former case, and their ratio of 4 in the latter case. An analysis of the spectra has shown the presence of intermediate groups of momenta, located between the fundamental line and the fine-structure line, and having an energy equal to the energy of the α particles of the fine structure and the energy of the conversion electrons that are emitted from the L shell of the atom after the emission of an α particle.

Card 2/2

TITLE: Thin Large Area α-Active Sources (Tonkiye α-Aktivnyye istochniki bol'shoy ploshchadi)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 108-109 (USSR)

SOV/48-22-7-13/26

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Investigation of the Lower Excited Th^{230} Levels by Means of α-e_K Coincidences (Izucheniye nizhnikh vozbuzhdennykh urovney Th^{230} putem α-e_K-sovpadeniy)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol. 22, Nr 7, pp. 824-826 (USSR)

ABSTRACT: An apparatus for recording the α-e_K coincidences was built by the authors. It consists of a pulse ionization chamber into which a proportional counter for recording the conversion electrons is placed. With this equipment the α-spectrum of U_{234} was examined with respect to coincidences with the conversion electrons. The apparatus is described. Suppression of noise from random α-α coincidences is provided for in the radio unit. During 24 hours the instability of the whole radio unit was less than 0,2 %. - As was expected, there were no main groups of α-particles of U^{238} and U^{235} in the α-spectrum of U^{234}. The α_1 group corresponds to the transition to the 2^+ level of the daughter nucleus. From an analysis of

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Phys. Tech. Inst. AS USSR

the curve obtained, the intensity of the transition to the 4^+ level can be determined. It is $(0,35 \pm 0,15\ \%)$ (the intensity of the α_1 group being considered as known). The level energy is 170 keV, as results also from the generalized nuclear model. It can beassumed that the 53 keV γ-quanta correspond to the transition from the 2^+ to the ground level, while those having 118 keV correspond to one from the 4^+ to the 2^+ level. The transition from the 4^+ to the ground level has not been observed until now although it is not impossible. With the use of the theoretical values of the conversion coefficient for the K and L shells (Refs 10, 11), and of the experimental values for the ratio $N_{\gamma-53}/N_{\gamma-118} = 2,5$, the intensity of the transition to the 4^+ level can be determined. Its value coincides with the experimental value of 0,35 %. -

The authors acknowledge the advice of B. A. Bochagov and S. N. Nikolayev. There are 3 figures and 11 references, 8 of which are Soviet.

Card 2/3

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye. SOV/56-34-5-54/61

TITLE: Inferior Excited (Rotation-)Levels of Th^{234} (O nizhnikh vozbuzhdennykh (rotatsionnykh) urovnyakh Th^{234})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol. 34, Nr 5, pp. 1345 - 1346 (USSR)

ABSTRACT: By means of an ionisation chamber with a grid (Ref 1) the authors investigated the energy spectrum of the α-particles from U^{238}. The spectrum obtained this way is given in a figure. In this figure α_0 denotes the main group of the α-particles from U^{238} with an energy of 4,182 MeV. According to the opinion of the authors the group α_2 corresponds with the transition to the second level of Th^{234}. The intensity of this transition is 0,25 + 0,1%. The level is located at ~ 160 KeV. The ratio of the energies of the first and second level agrees with the theoretical value obtained on the basis of the simplified nuclear model. This level probably is the +4 one. The group α_1 corresponds

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Inferior Excited (Rotation-)Levels of Th^{234}

SOV/56-34-5-54/61

with the transition to the level + 2 of the daughter nucleus. The transition to the level +2 occurs with an intensity of 23%. This value of the intensity well agrees with the results of various previous works (Refs 2-5). The scheme of the U^{238}-decay, constructed on the basis of the results of this paper, is given in a diagram. At present more measurements concerning a better separation of the group α_2 are performed which will render possible a more accurate precision of the results obtained here. There are 2 figures and 5 references, 1 of which is Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology, AS USSR)

SUBMITTED: February 20, 1958

Card 2/3

24(7)

AUTHORS: Kocharov, G. Ye., Komar, A. P., Korolev, G. A., Marov, I. N., Surkov, Yu. A. SOV/48-23-7-15/31

TITLE: The Fine Structure of the α-Spectrum of Th^{229} (Tonkaya struktura α-spektra Th^{229})

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 7, pp 855-858 (USSR)

ABSTRACT: The radioactive isotope Th^{229} is obtained by the α-decay of U^{233}; as the half-life of the latter is $1.62 \cdot 10^5$, that of Th^{229}, however, only 7,000 years, a large quantity of U^{233} is necessary for the exact determination of the activity of the isotope Th^{229}. A paper (Ref 1) is mentioned in which the α-decay of this isotope was investigated, but it did not deliver satisfactory results due to a poor resolving power. The present investigation was carried out with an ionization-α-spectrometer of high resolving power, and the chemical production of the isotope from oxides of the isotope U^{233} is described in detail. The isotope U^{233} investigated by the authors contains -

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The Fine Structure of the α-Spectrum of Th^{229} SOV/48-23-7-15/31

besides the isotope Th^{229} - also Th^{228}; the energies of the unknown α-lines were determined from the well-known α-lines of Th^{228} and its daughter nuclei. The energy of the principal group of the α-particles was determined by several measurements at 5040 kev, the determination of the energy of the other α-groups was carried out by electric collimation. A table contains the energies determined by the authors and the relative intensities of the lines of the isotope Th^{229}, and figure 5 shows a scheme of its decay. The authors thank Ye. A. Damaskinskiy of the LPI imeni Kalinin for his help in this work. There are 5 figures, 1 table, and 8 references, 6 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Physico-technical Institute of the Academy of Sciences, USSR)

Card 2/2

21(8)

AUTHOR: Kocharov, G. Ye., Komar, A. P., Korolev, G. A. SOV/56-36-1-11/62

TITLE: Energy Spectra of α-Particles of Long Th^{232} and U^{238} Isotopes (Energeticheskiye spektry α-chastits dolgoshivushchikh izotopov Th^{232} i U^{238})

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 1, pp 68-75 (USSR)

ABSTRACT: Investigation of α-spectra fine structure makes it possible to investigate the weakly excited states of heavy nuclei as well as the determination of several parameters of nuclear structure. As the magnetic spectrometers otherwise used are not suited for fine-structure investigations of α-spectra of long-life isotopes because of their low light intensity, and as the usual ionization chambers furnish a half-width of lines of only ~50 keV, the authors endeavored to produce a device having a better resolving power. In 1955 and 1956 they developed an ionization chamber in their laboratory, which had a grid for an α-line half-width of 30 keV (Refs 1-4), with the help of which it was possible to carry out an investigation of the fine structure of the α-spectra of Th^{232} and U^{238}. The present

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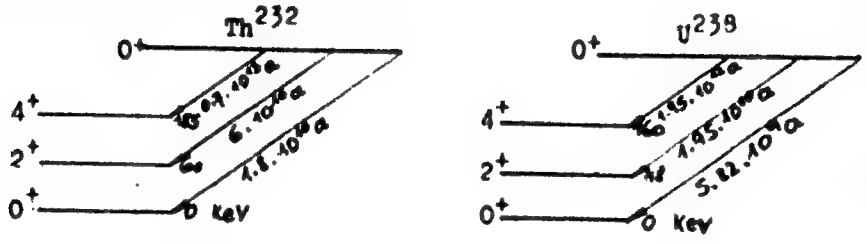
paper gives a very detailed description of the device and of its mode of operation. The following was investigated:
1) The α -transition to the first excited level of the daughter-nuclei of Ra^{228} and Th^{234}. Figure 4 shows the α-spectrum of Th^{232} (measuring time 25 hours), and figure 5 shows that of U^{238} (1.5 hours). For the former an α_1-intensity of (23 ± 3) % is given, as well as an energy of the first level of (60 ± 5) keV, for U^{238} an α_1-intensity of (23 ± 4) % and an energy of the corresponding level of (48 ± 5) keV.
2) Transition to the second level of the daughter nuclei of Ra^{228} and Th^{234}. Figure 6 shows N(E) for Th^{232} (measuring time 90 hours). Owing to the great light intensity and the good resolving power of the ionization chamber, the spectrum shows distinct peaks for $\alpha_1(2^+)$ and $\alpha_2(4^+)$. Figure 7 shows a similar spectrum for U^{238} (30 h). The following data are given: Energy of the second level (185 ± 5) keV, intensity (0.2 ± 0.08) % and (160 ± 5) keV intensity (0.23 ± 0.07) % respectively.
A comparison between experimental data and those calculated by Nosov (Ref 17) and Komar et al (Ref18) shows good agreement

(see table). In conclusion, the following decay schemes are suggested for Th^{232} and U^{238}:



In conclusion, the authors thank Yu. A. Surkov for placing the thorium sources at their disposal, V. G. Nosov for discussions and for placing the manuscript of his paper at their disposal, and they further express their gratitude to

Energy Spectra of α-Particles of Long-Life Th^{232} and U^{238} Isotopes SOV/56-36-1-11/62

Ye. A. Damaskinskiy for his assistance and to V. A. Kireyev and S. N. Nikolayev for their advice. There are 8 figures, 1 table, and 21 references, 10 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Physico-Technical Institute of the Academy of Sciences, USSR)

SUBMITTED: August 8, 1958

Card 4/4

KOCHAROV, G. Ye., Cand Phys-Math Sci -- (diss) "Investigation of arc-spectra of uranium and thorium isotopes by an ionization arc-spectrometer at high resolution." Leningrad, 1960. 9 pp; (Academy of Sciences USSR, Radium Inst im Khlopin); 250 copies; free; bibliography on pages 8-9 (16 entries); (KL, 17-60, 139)

S/048/60/024/03/14/019
B006/B014

21.5200

AUTHORS: Kocharov, G. Ye., Yamshchikov, M. A.

TITLE: The Ionization Chamber in the Magnetic Field

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 350-356

TEXT: The article under review was read at the Tenth All-Union Conference of Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). Pulsed ionization chambers are frequently used for investigating nuclear reactions and α-spectra of small isotope amounts. Proportional counters placed in the chamber are used to record conversion electrons (coincidence measurement of α-particles and conversion electrons). To improve energy resolution, to enlarge the energy range, and to reduce the background of soft electrons, the proportional counter is arranged in a magnetic field such that, e.g., the α - e_K coincidence recording takes place in a magnetic field. In this connection, an investigation of the influence exerted by the magnetic field upon the chamber operation

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The Ionization Chamber in the Magnetic Field

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is of interest, as a knowledge of them is necessary for the proper selection of the size and mode of operation of the chamber. The aim of the authors was to conduct such an investigation. The influence exercised by the magnetic field on the electronic apparatus is briefly discussed first. After screening off the tubes in the preamplifier and removing the remaining parts of the apparatus by 3 m from the magnet, a test proved that when the magnet was switched on, the amplitude remained unchanged up to 0.05%. The influence exerted by the field on the trajectories of the ionization electrons is investigated next. It is shown that the field gives rise to a drift of electrons (Fig. 2), that, however, the amplitude of the pulse hitting the high-voltage electrode is not influenced thereby. Nor is the amplitude influenced by electrons gathering on the chamber walls. The influence exerted by the magnetic field on conversion electrons when α-spectra are taken is discussed in the next section. As may be seen from Figs. 8 and 9 (they show the computed and the measured α-spectrum of U^{234} with and without magnetic field, theory shows a rise in the intensity of the α_1-group in the presence of a magnetic field, which fact is

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The Ionization Chamber in the Magnetic Field

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B006/B014

substantiated by experiments. In ionization, α-particles also produce fast, so-called δ-electrons, besides slow electrons, whose maximum energy (in 5-Mev α-particles) amounts to 2.5 kev. The influence exerted by a magnetic field on such particles is briefly studied in the last section, and the influence of the field on δ-electrons is found to be negligible. It is stated in conclusion that with a proper selection of the size and the working conditions of the chamber, the magnetic field does not influence the resolution of the device, but that, on the other hand, it is capable of reducing the effect of conversion electrons. The authors finally thank A. P. Komar for his assistance. There are 9 figures and 6 references, 5 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Institute of Physics and Technology of the Academy of Sciences, USSR)

Card 3/3

S/048/60/024/03/15/019
B006/B014

21.5200

AUTHORS: Korolev, G. A., Kocharov, G. Ye.

TITLE: Investigation of Pulses Occurring on the Grid of an Ionization Chamber

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 3, pp. 357-364

TEXT: The article under review was read at the Tenth All-Union Conference on Nuclear Spectroscopy (Moscow, January 19 - 27, 1960). The use of shielding grids in pulsed ionization chambers makes it necessary to study the grid pulses. The problem of the shape of pulses from the collecting and from the high-voltage electrode and the proper choice of the amplifier transmission band have already been studied in Refs. 3 and 4. A maximum signal-to-noise ratio was given as basic criterion for the selection of transmission bands. In the present paper, the authors show that in the case of grid pulses the most favorable transmission band is primarily determined by the condition of conservation of the angular distribution function. First, the authors investigate an

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Investigation of Pulses Occurring on the Grid of an Ionization Chamber

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ionization chamber with two grids, and the shape of voltage pulses is studied on the first grid. It is assumed that no diffusion of the "electron track" takes place, that the density of ionization along the alpha track is constant, and that no electronegative impurities exist in the gas of the chamber. The chamber is schematically represented in Fig. 1, and Fig. 2 shows grid pulses. A number of formulas representing the grid potentials as functions of different variables are then derived. Next, the authors describe a theoretical study of the proper selection of transmission bands for operations with negative grid pulses. They investigate the effect of diffusion upon negative grid pulses, and the last section briefly deals with positive grid pulses (due to positive ions). In conclusion, it is stated that the following conditions must be satisfied for the use of negative grid pulses for angular measurements: The chamber must be filled with a gas having a small diffusion coefficient. It is necessary to use transmission bands by which the angular distribution is not distorted. In order to guarantee exact angular distribution in the case of positive grid pulses, it is necessary to use a chamber gas in which the electron drift

Card 2/3

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S/056/60/038/005/052/057/XX
B006/B070

AUTHORS: Komar, A. P., Korolev, G. A., Kocharov, G. Ye.

TITLE: Study of the Alpha Decay of U^{236} ✓

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1436 - 1438

TEXT: The alpha spectrum of U^{236} was studied by means of a high resolution ionization chamber with grid. This chamber permits to determine the number of ion pairs formed by the alpha particles in the chamber. The ion pair number N and the alpha particle energy E are related by the equation $E = Nw$, where w is the energy required for the formation of an ion pair. w depends on the gas filling of the chamber and on the energy of the alpha particles. To separate the two effects, E is set equal to $Nw_0 + \varepsilon_0$, where w_0 is the mean pair formation energy for $E > 4$ Mev, and ε_0 is a parameter depending on the nature of the gas. (ε_0 = 83 kev for a mixture of argon and methane). The energy of alpha particles was determined from the

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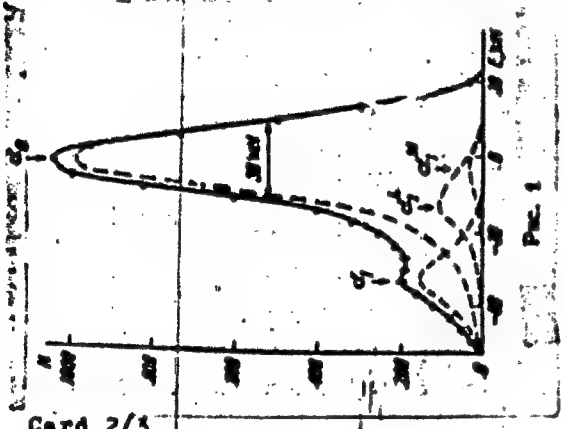
Study of the Alpha Decay of U^{236}

relation $E_{236} = aE_{234} + \varepsilon_0'(1-a)$, where a is the pulse-height ratio of the alpha particles of U^{236} and U^{234}. Thus, E = (4.488 ± 0.003)Mev is obtained. Fig. 1 shows the spectrum of alpha particles for a channel width of 5 kev; the broken curves give the result of an analysis in which account was taken of the distortion of the spectrum due to the conversion electrons. The corresponding level scheme is shown in Fig. 3.



Card 2/3

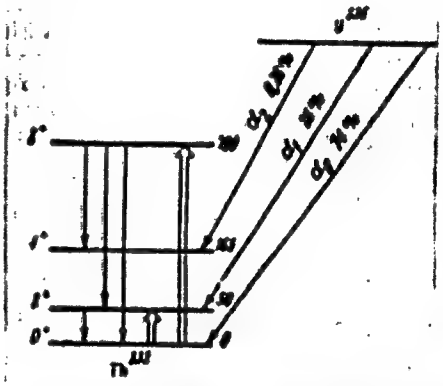


Fig. 3

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Study of the Alpha Decay of U^{236}

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B006/B070

Fig. 2 shows the alpha spectrum taken for a channel width of 13.9 kev. The three alpha groups correspond to the transitions to 0^+, 2^+, and 4^+ level, respectively, of the Th^{232} nucleus. The distance of the α_2 group from the ground level is 160 kev; the intensity of this group is $(0.26 \pm 0.1)\%$. Professor S. A. Baranov is thanked for having supplied the U^{236} samples. There are 3 figures and 8 references: 2 Soviet and 6 US.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR (Leningrad Institute of Physics and Technology of the Academy of Sciences USSR)

SUBMITTED: December 15, 1959

X

Card 3/3

DAMASKINSKIY, Ye.A.; KOROLEV, O.A.; KOCHAROV, O.Ye.

Effect of the sticking of electrons in an ionization chamber.
Prib.i tekh.eksp. 6 no.5:51-54 S-O '61. (MIRA 14:10)

1. Fiziko-tekhnicheskiy institut AN SSSR.
(Ionization chambers)

S/048/61/025/002/008/016
B117/B212

AUTHORS: Kocharov, G. Ye., Korolev, G. A.

TITLE: Ionization alpha spectrometer with high resolution

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 2, 1961, 237-256

TEXT: The present paper was read at the 11th Annual Conference on Nuclear Spectroscopy (Riga, January 25 to February 2, 1961). The authors describe the ionization alpha spectrometer developed by them. It has a high resolution (half-width of the alpha lines: 25÷35 kev) and a high light intensity (the solid angle used was 20÷30% of 4π). The spectrometer is schematically shown in Fig. 10. It consists of: 1) ionization chamber with grid; 2) radiotechnical system (which, in turn consists of: 1) preamplifier; 2) amplifier; 3) limiter; 4) one-channel analyser; 5) 28-channel analyser; 6) pulse generator; and 7) amplitude indicator); and 3) gas pump unit. The main part is the ionization chamber, a brass cylinder with a capacity of 22 liters. The collector electrode is mounted on the bottom of the chamber. The grid and the high-voltage electrode are fastened to a special slide, which makes it

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possible to change the distance between the electrode. 4-mm thick brass discs are used as electrodes. The diameter of the high-voltage electrode measures 220 mm, that of the collector electrode 120 mm. The grid consists of nichrome wire (diameter 0.1 mm) and was welded to a stainless steel ring. The distances between the wires are 1.5 mm. High-voltage wires are inserted in the chamber wall, and wires for pulse transmission. The whole system has been evacuated to 10^{-2} mm Hg, and then filled with a mixture of argon and 3% methane. The operating pressure is 1.5-1.8 atm. The electrode potentials have been selected such that a recombination and deposition of electrons on the grid is excluded. The electrode pulses are passed through a noiseless preamplifier (Fig. 11) and then fed to an amplifier that has an amplification coefficient of 10^3. The amplifiers are modified models of the type Elmor-100. The use of a limiter reduces the analyser channel. The channel-width may be varied from 5 to 50 kev by changing the amplification coefficient. The one-channel differential discriminator has been used for electric collimation. The 28-channel analyser, designed and constructed after plans of the laboratory of the Physicotechnical Institute (Ref. 14) is to be used for amplitude analysis. The electron pulses provide a means to calculate the alpha-particle energy and their angle of emergence. In order

Ionization alpha spectrometer ...

to obtain a high resolution, the authors have thoroughly studied all reasons that might influence the former. These reasons are divided into two groups with respect to their influence upon the alpha spectrum: 1) Fluctuation of ion pairs and radio noises which lead to a Gaussian amplitude distribution of pulses without shifting the maximum, and 2) thickness of the radiation source, sticking of electrons to electronegative additives, no screening of the grid and the end front of the pulses cause an expansion of the alpha line, and also a shift of the maximum towards smaller energies. An investigation of these factors made it possible to find formulas for determining the half-width of the alpha line and the shift of the maximum. By a proper choice of the amplifying tube and its operation conditions (plate potential 50÷60 v, filament voltage 4÷6 v) it was possible to cut down the radio noises and reduce their half-width to 16 kev. The use of an argon-methane mixture completely reduces the sticking of electrons to electronegative additives (Figs. 12 and 13). A considerable increase in drift velocity added to improve the energy and time resolution. Application of electric collimation (Fig. 9) improved the resolution of the ionization chamber without influencing the light intensity of the instrument. The novel ionization alpha spectrometer has been used to study the fine structure of alpha spectra of

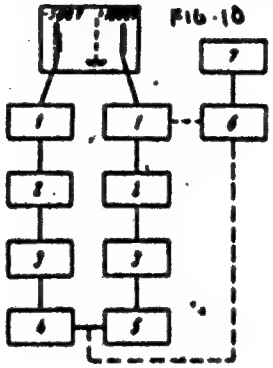
Ionization alpha spectrometer ...

uranium and thorium isotopes (Tables 2-4). By strict observation of the corrections, and due to the high resolution it was possible to measure the alpha-line energy with an accuracy of 0.05÷0.1%. The energy of the main group of alpha particles from U^{236} was measured with an accuracy of ± 3% (Ref. 18). Laboratory experiments have shown that a use of the electrode pulse reduces the background. By a specific adjustment it was possible to obtain 0.1 to 0.2 pulses per hr on the spectral region that corresponds to an alpha line. Thus it was possible to separate the alpha line with an intensity of up to one pulse per hr from the spectrum, i.e., also with sufficient accuracy. At a surface of 200 cm^2 and a thickness of 20÷30 $\mu g\ cm^{-2}$ this corresponds to a half-life of 10^{15}÷10^{16} years. Combined with a 48-channel time analyzer, the ionization alpha spectrometer has been used to measure short half-lives. Thus, half-lives down to 10^{-4}-10 sec have been measured. The results are more accurate than those obtained after other methods (Ref. 32). In order to determine the energy of α particles and the corrections caused by electric collimation (distortion of the intensities of α lines), it is necessary to know for argon the dependence of the distance of the ionic center of mass on the start of the alpha particles. This dependence has been determined experimentally and mathematically (Figs. 15

and 16). The calculations have been made by the degree student Ye. A. Damaskinskiy of the LPI. There are 16 figures, 4 tables, and 32 references: 21 Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk (Institute of Physics and Technology of the Academy of Sciences)

Fig. 10



Card 5/6

KOCHAROV, G.Ye.

Total ionization produced by α-particles in gaseous mixtures.
Izv. AN SSSR. Ser. fiz. 25 no.7:862-865 Jl '61. (MIRA 14:7)

1. Fiziko-tekhnicheskiy institut AN SSSR.
(Ionization of gases) (Alpha rays)

26440
S/048/61/025/007/002/005
B108/B209

9.6150

AUTHORS: Korolev, G. A., and Kocharov, G. Ye.

TITLE: Operation of proportional counters

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 25, no. 7, 1961, 866 - 870

TEXT: This paper was read at the XI Annual Conference on Nuclear Spectroscopy in Riga, January 25 - February 2, 1961. V. Veksler et al. (Ref. 1: Ionizatsionnyye metody issledovaniya izlucheniy. GITTL, M., 1949) and S. Korff (Ref. 2: Schetchiki elektronov i yadernykh chastits. IL. M., 1947) showed that the stability of a counter may be increased by adding multi-atomic impurities to the inert gas in this counter. In order to study the effect of such impurities one has to observe the variation of the gas amplification factor which can be done the better, the better the energy resolution of the counter. This resolution which down to a certain A_{cr} (critical gas amplification factor, given by $EA_{cr} \approx 10^8$ ev) is independent of the gas amplification factor is interrelated with the primary ionization by the relation $\frac{\Delta E}{E} \approx \frac{2.36}{\sqrt{m_0}}$, where m_0 indicates the number of ion

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Operation of proportional...

pairs. The most important items affecting the line half-width are discussed. With a gas amplification factor equal to 5, the author obtained relative half-widths of 1.7 and 1.9% for the alpha-lines of U^{238} and U^{234}, respectively, at an argon pressure of 1.3 atm. The biggest share to the half-width is contributed by end-effects and by the effect of the space charge. The gas amplification factor was found to be higher for argon containing a small quantity of methane (up to about 6.2%) than for pure argon. The theory of M. E. Rose and S. A. Korff (Ref. 6: Phys. Rev., 59, 850 (1941)) is shown to be not applicable to gas mixtures on account of electrons forming in second-kind collisions. The gas amplification factor is given by the expression $A = e^{\int_{r_o}^{r_a} \alpha dr}$, where r_o denotes the radius of the counter wire, r_a the distance at which the avalanche arises, α the number of ion pairs formed by one electron per unit length. The authors give the formula $A = \exp\left(\alpha \int_{r_o}^{r_a} s(r)dr\right)$, which represents A as depending

Card 2/3

VOLKOV, Yu.M.; KOMAR, A.P.; KOROLEV, G.A.; KOCHAROV, G.Ye.

Application of an ionization γ-spectrometer with a time analyser for half-life determinations. Izv. AN SSSR. Ser. fiz. 25 no.9:1188-1196 '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR.
(Spectrometry)
(Radioactive substances—Decay)

34171
S/048/62/026/002/012/032
B101/B102

26.2541

AUTHORS: Korolev, G. A., and Kocharov, G. Ye.

TITLE: Measurement of the alpha-particle energy of the long-lived isotopes Th^{232} and Bi^{210*}

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 235 - 236

TEXT: The main alpha line of Th^{232} and the alpha lines of Bi^{210*} were measured with an ionization alpha spectrometer. The method was described previously (A. P. Komar, G. A., Korolev, G. Ye. Kocharov, Zh. eksperim. i teor. fiz., 38, 1436 (1960)). The Th source was prepared by electrodeposition onto a stainless steel disk and radiographically examined for homogeneity. The alpha line of Ra^{224} (5681 kev) was used as reference line. It was found that E_α = 4009 ± 5 kev. An ionization alpha spectrometer with a better resolution permitted a more precise determination of the energy and intensity of the alpha lines of Bi^{210*}:

Card 1/1 2

Measurement of the alpha-particle...

Line	E_α, kev	Intensity, %
α_1	4953 ± 5	57.6 ± 1.0
α_2	4916 ± 5	36.0 ± 1.0
α_3	4568 ± 5	6.0 ± 0.5
α_4	4425 ± 10	0.4 ± 0.2

The alpha line of U^{234} (4768 kev) was used as reference line The energy levels of Tl^{206} were corrected on the basis of these data (Fig.). L. I. Rusinov is mentioned. S. V. Golenetskiy is thanked for a discussion, and V. V. Pashuk for assistance. There are 1 figure, 2 tables, and 9 references: 6 Soviet and 3 non-Soviet. The reference to the English-language publication reads as follows: Harvey, B. G., Jackson, H. G., Eastwood, T. A., Hanna, G. C., Canad. J. Phys., 35 250 (1957).

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

Card 2/2

3,172
S/048/62/026/002/013/032
B106/B108

24.6400

AUTHORS: Abrosimov, N. K., and Kocharov, G. Ye.

TITLE: Effect of source thickness on the form of energy and angular distributions of α-particles

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya, v. 26, no. 2, 1962, 237-244

TEXT: The effect of the thickness of the radiation source on the form of the spectrum of one group of α-particles was determined. The results can be generalized to some other groups of α-particles and other charged particles. The energy and angular distributions of α-particles emitted from a plane uniform source of thickness h were made the basis to the calculations. The number of particles with energies of from E to E + dE emerging per unit time from one surface element dS at angles of from θ to θ + dθ (from the surface normal) is $dN_{SE\theta} = \eta \sin\theta\cos\theta dr d\theta dS/2$ (1)

(η = number of α-particles emitted per unit volume per unit time; r may lie between $R_0-R(E)$ and $R_0-R(E)-(dR/dE)dE$; R_0 = total range of α-particles in

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Effect of source thickness ...

the source; R(E) = range of α-particles in the source as a function of energy). Integrating Eq. (1) over S neglecting the edge effect (sufficiently large source) yields the energy and angular distributions of α-particles on the source surface: $d^2N/dEd(\cos\theta) = (N_0/2h)\cos\theta dR/dE$ ($N_0 = \eta Sh$ (number of α-particles emitted by the entire source per unit time). For sources with $h \geq R_0$ (thick source)

$$\frac{d^2N}{dEd(\cos\theta)} = \begin{cases} \frac{N_0}{2h}\cdot\frac{dR}{dE}\cos\theta & E \leq E_0,\ 0 \leq \theta \leq \frac{\pi}{2} \\ 0 & E > E_0 \end{cases} \qquad (2).$$

For sources with $h < R_0$ (thin sources)

$$\frac{d^2N}{dEd(\cos\theta)} = \begin{cases} \frac{N_0}{2h}\cdot\frac{dR}{dE}\cos\theta & \begin{cases} E \leq E_x,\ \theta_x \leq \theta \leq \frac{\pi}{2} \\ E_0 > E > E_x,\ 0 \leq \theta \leq \frac{\pi}{2} \end{cases} \\ 0 & \begin{cases} E < E_x,\ 0 \leq \theta < \theta_x \\ E > E_0 \end{cases} \end{cases} \qquad (3).$$

Integration of (2) and (3) over θ between 0 and θ_x yields the energy

Card 2/5

Effect of source thickness ...

distribution of α-particles on the source surface if all α-particles wi[th] θ between 0 and θ_k are recorded; for sources with $h \geqslant R_0$

$$\frac{dN}{dE} = \begin{cases} \frac{N_0}{4\pi} \frac{dR}{dE} - \frac{N_0}{4\pi} \cdot \frac{dR}{dE} \cos^2\theta_k & E < E_0 \\ 0 & E > E_0 \end{cases} \quad (4),$$

for sources with $h < R_0$

$$\frac{dN}{dE} = \begin{cases} 0 & E < E_k \\ \frac{N_0 h}{4[R_0 - R(E)]^2} \cdot \frac{dR}{dE} - \frac{N_0}{4\pi} \cdot \frac{dR}{dE} \cos^2\theta_k & E_k < E < E_0 \\ \frac{N_0}{4\pi} \cdot \frac{dR}{dE} - \frac{N_0}{4\pi} \cdot \frac{dR}{dE} \cos^2\theta_k & E_0 < E < E_k \\ 0 & E > E_0 \end{cases} \quad (5)$$

(E_k - rate of the equation $\cos\theta_k = h/(R_0 - R(E_k))$; E_k vanishes when $\theta_k \geqslant \arccos h/R_0$). When all α-particles emitted at arbitrary angles are recorded, θ_k becomes $\pi/2$, and the second terms in Eqs. (4) and (5) cancel

Card 3/5

out. On the assumption that the dependence of the range of the α-particles on the energy in different media obeys the power function $R = AE^n$ ($n \approx 1.5$), Eqs. (2)-(5) take the following forms:

$$\frac{d^2N}{2\pi d(\cos\theta)} = \begin{cases} \frac{1}{4\pi} N_0 A n E^{n-1} \cos\theta & E < E_0,\ 0 < \theta < \frac{\pi}{2} \\ 0 & E > E_0 \end{cases} \quad (2'),$$

$$\frac{dN}{dE} = \begin{cases} \frac{1}{4\pi} N_0 A n E^{n-1} - \frac{1}{4\pi} N_0 A n E^{n-1} \cos^2\theta_m & E < E_0 \\ 0 & E > E_0 \end{cases} \quad (4'),$$

$$\frac{d^2N}{2\pi d(\cos\theta)} = \begin{cases} \frac{1}{4\pi} N_0 A n E^{n-1} \cos\theta & \begin{cases} E < E_m,\ \theta_E < \theta < \frac{\pi}{2} \\ E_0 > E > E_m,\ 0 < \theta < \frac{\pi}{2} \end{cases} \\ 0 & \begin{cases} E < E_m,\ 0 < \theta < \theta_E \\ E > E_0 \end{cases} \end{cases} \quad (3'),$$

$$\frac{dN}{dE} = \begin{cases} 0 & E < E_m \\ \frac{N_0 A n E^{n-1}}{4R_0^3 \left[1 - \left(\frac{E}{E_0}\right)^n\right]^3} + \frac{1}{4\pi} N_0 A n E^{n-1} \cos^2\theta_m & E_m < E < E_0 \\ \frac{1}{4\pi} N_0 A n E^{n-1} - \frac{1}{4\pi} N_0 A n E^{n-1} \cos^2\theta_m & E_m < E < E_0 \\ 0 & E > E_0 \end{cases} \quad (5').$$

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Effect of source thickness ...

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B106/B108

Here,

$$R_0 = \left(\frac{R_0 - h}{\lambda}\right)^{\frac{1}{n}}, \quad E_R = \left(\frac{R_0 - \frac{h}{\cos\theta_R}}{\lambda}\right)^{\frac{1}{n}}, \quad \theta_R = \arccos\frac{h}{R_0\left[1 - \left(\frac{E}{R_0}\right)^n\right]}$$

The allowance for the thickness of the source in absolute counting of charged particles, as well as the effect of the source thickness on the accuracy of energy measurements in an ionization α-spectrometer and on the pulses of a high-voltage electrode and of the grid of an ionization chamber were studied on the basis of these results. V. O. Maydenov, undergraduate degree student of the LPI im. M. I. Kalinina (LPI imeni M. I. Kalinin), is thanked for calculations. There are 4 figures and 5 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

Card 5/5

KOCHAROV, G.Ye.; KOROLEV, G.A.

Theory of the action of a proportional counter. Izv.AN SSSR. Ser.fiz. 27 no.2:301-307 F '63. (MIRA 16:2)

1. Fiziko-tekhnicheskiy institut AN SSSR im. A.F.Ioffe.
(Nuclear counters)

KOCHAROV, G.Ye.; STARBUNOV, Yu.N.

Simultaneous measurement of the energy and angle of departure of a particle in a semiconductor detector. Izv. AN SSSR. Ser. fiz. 27 no.7:940-941 '63. (MIRA 16:8)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.
(Scintillation counters) (Electronic measurements)

KOCHAROV, G. Ye.; NAYDENOV, V. O.

"Low Background, Gas-Filled Counters for Electrons and X-Rays."

report submitted for All-Union Conf on Nuclear Spectroscopy, Tbilisi, 14-22 Feb 64.

FTI (Physico Technical Inst)

ACCESSION NR: AP4031172 S/0056/64/046/004/1470/1472

AUTHOR: Konstantinov, B. P.; Kocharov, G. Ye.

TITLE: Interaction between ultrahigh energy cosmic rays and neutrinos in the universe

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1470-1472

TOPIC TAGS: cosmic ray, neutrino, nuclear reaction, neutrino concentration, neutrino energy density

ABSTRACT: It is shown that the interaction between cosmic ray particles with energies larger than 10^{20} eV per nucleon and neutrinos may be offset by the possible enormous concentration of neutrinos in the universe, so that the nuclear interactions with the neutrinos must be taken into account in addition to the interactions with hydrogen and thermal photons. The possible values of the neutrino concentrations are first estimated, and the effect of the interaction of the cosmic rays with neutrinos is then compared with that of the nuclear reactions with hydrogen and thermal photons. It is shown, for example, that for maximum neutrino density, the lifetime of iron nuclei against reactions with neutrinos is $< 10^{12}$ years, whereas for minimum density the lifetime is $\sim 10^{24}$ years. The corresponding values for

Card 1/2

ACCESSION NR: AP4041143 S/0020/64/156/004/0781/0784

AUTHOR: Kocharov, G. Ye.; Konstantinov, B. P.

TITLE: Proton-proton cycle and solar neutrinoes

SOURCE: AN SSSR. Doklady*, v.156, no. 4, 1964, 781-784

TOPIC TAGS: solar proton proton cycle, neutrino detection, neutrino astrophysics, star energy production

ABSTRACT: The author discusses the possibilities of detecting solar neutrinoes resulting from the two cycles which might be responsible for the energy production in the sun. Of these two, the proton-proton cycle may produce neutrino of 13.6 Mev (by B^8 decay). If the nucleus Li^4 exists, its decay may produce a 18.9 Mev neutrino. The author calculates the possible concentrations of the intermediate products of the reactions, and their life-times, for assumed solar temperatures from 5 to 30×10^6 K. These data are needed for the estimation of the neutrino flux to be expected. The attempt by R. Davis (Bull. Am. Phys. Soc. 4, 4, 217, 1959) of detecting solar neutrinoes and its negative result is discussed. Orig. art. has: 2 figures and 2 tables.

Card 1/2

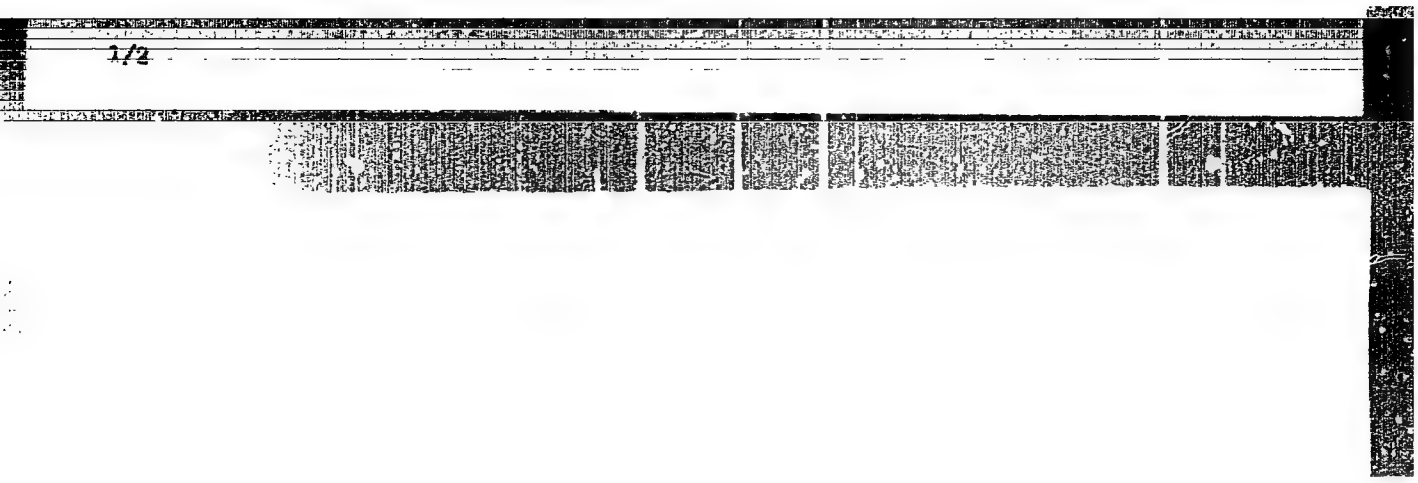
ACCESSION NR: AP4041143

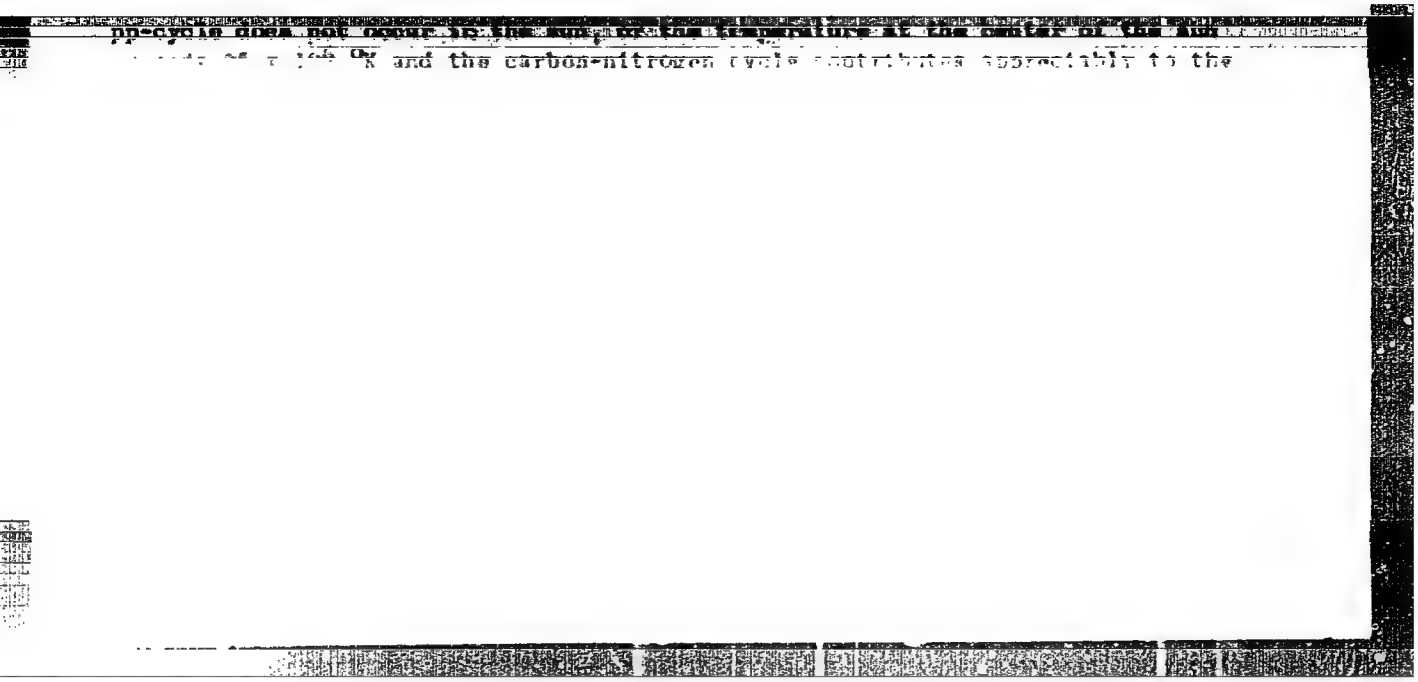
ASSOCIATION: Fiziko - Tekhnicheskiy institut, im. A. F. Ioffe, Akademii nauk SSSR (Physicotechnical Institute, Academy of Sciences, SSSR)

SUBMITTED: 10Jan64 ENCL: 00

SUB CODE: MP NO REF SOV: 000 OTHER: 008

Card 2/2





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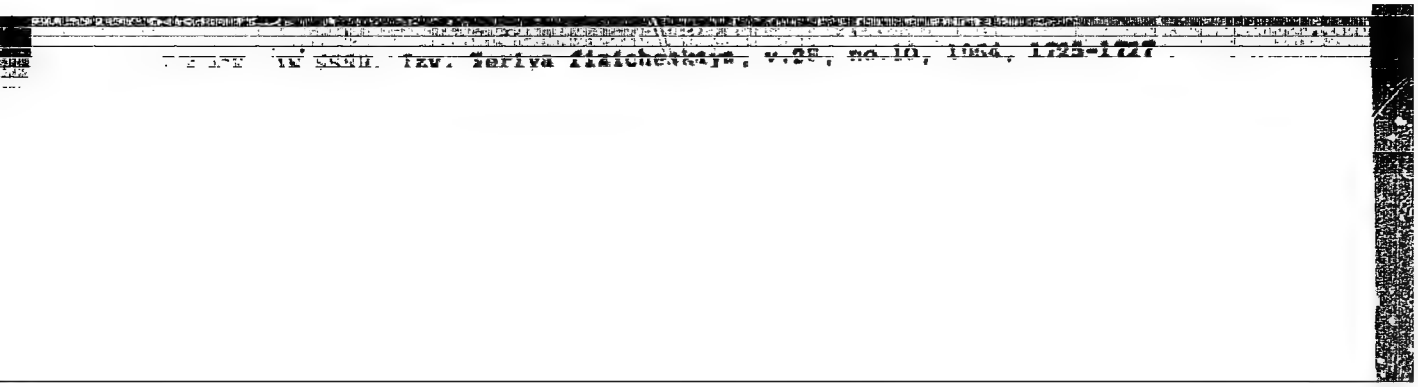

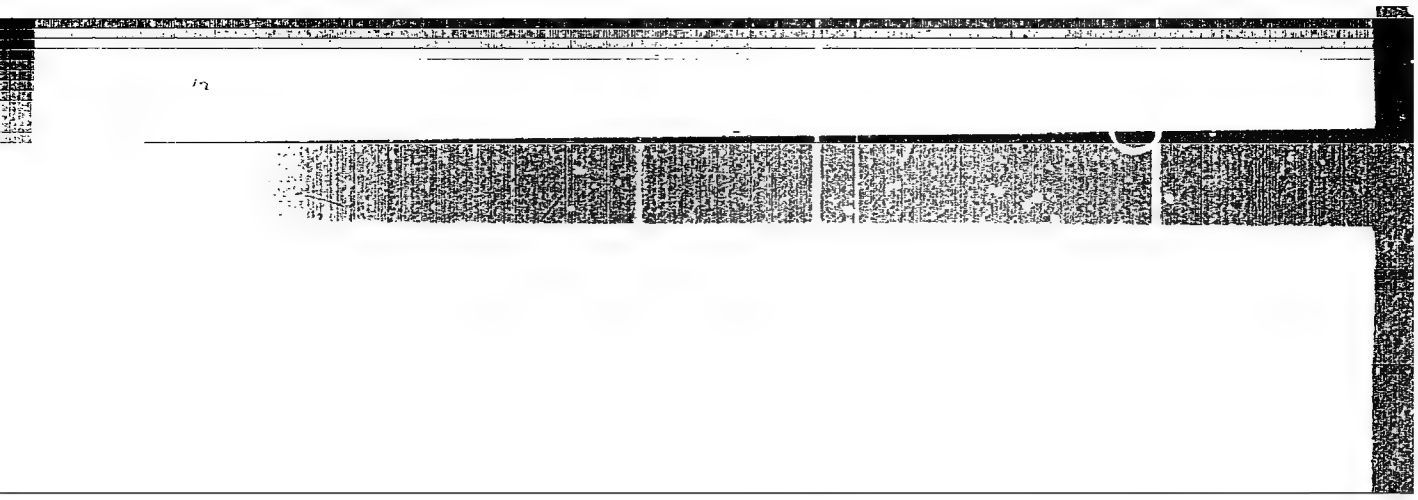

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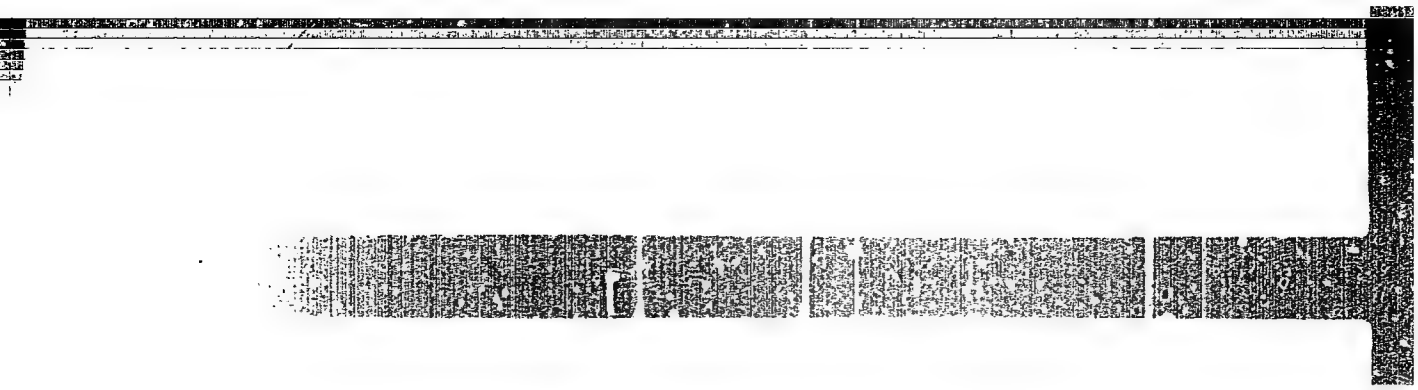

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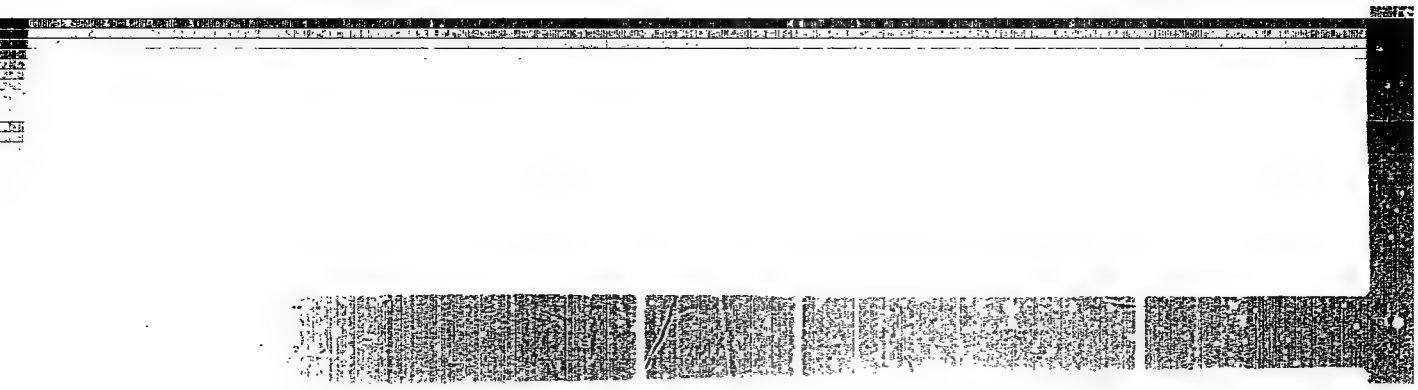

APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723420018-4"

KOCHAROV, G.Ye.

Effect of a neutrino background in the universe on the shape of the beta spectrum. Izv. AN SSSR.Ser.fiz. 29 no.5:794-799 My '65.

L 4462-66 EWT(l)/EWT(m)/FCC/T/EWA(m)-2/EWA(h) GS

ACC NR: AP5024647 SOURCE CODE: UR/0048/65/029/009/1734/1739

AUTHOR: Kocharov, G. Ye.

ORG: Physicotechnical Institute im. A.F.Ioffe, AN SSSR (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Nuclear reactions in stars, and solar neutrinos /Report, All-Union Conference on Cosmic Ray Physics held at Apatity 24-31 August 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 9, 1965, 1734-1739

TOPIC TAGS: star, stellar radiation, nuclear reaction, neutrino, thermonuclear reaction, solar temperature, temperature measurement

ABSTRACT: The rates in the interior of a star of the reactions of the proton-proton cycle (including side reactions involving Be^7, Li^7, B^8, and Be^6) were calculated as functions of the temperature. It was assumed that in the center of the star the concentrations (by weight) of hydrogen and helium are each 48 % and, for those reactions that have not had time to come to equilibrium, that the central density and age of the star are 145 g/cm^3 and 5 x 10^9 years, respectively. The calculated concentrations of the various reactants and the rates of the reactions are presented graphically. From these results the rate of the $Cl^{37}(\nu, e^-)Ar^{37}$ reaction at the Earth due to solar neutrinos was calculated as a function of the central solar temperature, with two differ-

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ACC NR: AP5024647

ent assumptions concerning the contribution of the carbon-nitrogen cycle to solar energy production. Experimental difficulties encountered in observing the neutrino reaction are discussed briefly. From the upper limit found by R.Davis (Phys. Rev. Let., 12, 303, 1964) for the rate of this reaction it is concluded that the central temperature of the sun does not exceed 18 x 10^6 °K. I express my deep gratitude to B.N.Konstantinov for his interest in the work, to M.M.Bredov for a valuable discussion of the results, and to V.A.Dergachev for assistance with the computations. Orig. art. has: 9 formulas, 8 figures, and 1 table.

SUB CODE: NP, AA/ SUBM DATE: 00/ ORIG REF: 004/ OTH REF: 017

Card 2/2

KONSTANTINOV, B.P., akademik; KOCHAROV, G.Ye.

Astrophysical phenomena and radiocarbon. Dokl. AN SSSR 165 no.1:63-64 N '65. (MIRA 18:10)

1. Fiziko-tekhnicheskiy institut im. A.F.Ioffe AN SSSR.

L 21756-66 EWT(m)/T/EWP(t)/EWA(h) IJP(c) JD
ACC NR: AT6004901 SOURCE CODE: UR/0057/66/036/001/0199/0201

52
46
B

AUTHOR: Viktorov,S.V.; Kocharov,G.Ye; Maydenov,V.O.

ORG: Physicotechnical Institute im. A.F.Ioffe, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: On the possibility of determining extremely small quantities of argon 37 and tritium

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 1, 1966, 199-201

TOPIC TAGS: proportional counter, radioactivity measurement, argon, tritium, radioisotope

ABSTRACT: The authors have constructed and tested small proportional counters with the view to their possible use for determining small quantities of Ar^{37} and H^3 in the gaseous state. The counters were from 0.1 to 2.7 cm^3 in volume and were filled with argon and methane at 1 atm. The counters were shielded with 360 g/cm^2 of concrete, 20 cm of iron, and/or 2.5 cm of mercury. The background due to penetrating cosmic rays was reduced by connecting the proportional counter in anticoincidence with a pair of plastic scintillation counters. The background of an 0.1 cm^3 counter was so far reduced that not a single count was recorded during a period of 27 hours in the energy region of the 2.8 keV Ar^{37} Auger line, although during the same period some 29 counts were recorded at other energies. It was possible reliably to detect the presence of

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L 21756-66

ACC NR: AP6004901

6

1.7×10^6 atoms of H^3 in a counter of 1.06 cm^3 volume. These results do not represent the limits of the capabilities of the counters described. The authors thank B.P. Konstantinov and M.M.Bredov for their interest in the work and for valuable advice, and V.A.Dergachev, V.V.Petrov, Yu.N.Starbunov, and V.I.Chesnokov for assistance in performing the experiments. Orig. art. has: 1 figure and 1 table.

SUB CODE: 18/ SUBM DATE: 06Jul65/ ORIG REF: 000/ OTH REF: 003

Card 2/2 fv

L 31041-66 EWT(1)/EWT(m)/EWA(h) GW

ACC NR: AP5027836 SOURCE CODE: UR/0020/65/165/001/0063/0064

AUTHOR: Konstantinov, B. P. (Academician); Kocharov, G. Ye.

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences SSSR (Fiziko-tekhnicheskiy institut Akademii Nauk SSSR)

TITLE: Astrophysical phenomena and radiocarbon

SOURCE: AN SSSR. Doklady, v. 165, no. 1, 1965, 63-64

TOPIC TAGS: supernova, stellar radiation, gamma radiation, carbon

ABSTRACT: Although the determination of the causes of variation in the C^{14} content of annual rings of trees constitutes a complex problem, a comparison of the radiocarbon activity of such rings with known astronomical phenomena may turn out to be a very promising method of investigation. As an example, the authors cite the increase in C^{14} content in the year 1700 and around 1050. It is known that the supernova Cassiopeia A exploded in 1700, and that the supernova in the Crab nebula exploded in 1054. If the composition of the electromagnetic radiation emitted by the explosion of a supernova contains gamma quanta with energies of tens of MeV, then it can generate C^{14} atoms in the earth's atmosphere by the reactions $O^{16}(\gamma, n)O^{15}$, $N^{14}(n, p)C^{14}$; $N^{14}(\gamma, n)N^{13}$, $N^{14}(n, p)C^{14}$; $O^{16}(\gamma, 2p)C^{14}$. An estimate shows that the probability of such formation of a C^{14} isotope by a gamma quantum of several tens of MeV is 1%. An estimate of the amount of energy emitted by the explosion of a supernova in the form of hard gamma radiation was made assuming that a 1% change in the activity of C^{14} could be measured. For Cassiopeia A (about 1700), the value obtained is 10^{51} ergs; for the Crab nebula and Kepler

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ACC NR: AP5027836 O

supernova (1604), 10^{50} ergs, and for the supernova of 1572, 10^{49} ergs. These values do not contradict the existing estimates of the energetics of supernovae.

SUB CODE: 03 / SUBM DATE: 30Jul65 / ORIG REF: 002 / OTH REF: 007

Card 2/2 LC

L 45255-66 EWT(l)/EWT(m)/EWP(t)/ETI IJP(c) JD/WW

ACC NR: AP6021990 SOURCE CODE: UR/0120/66/000/003/0005/0018

3/9
B

AUTHOR: Kocharov, G. Ye.; Maydanov, V. O.

ORG: Physico-Technical Institute, AN SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Low-noise gas-filled electron x-ray counters [Paper presented at the 14th all-Union Conference on Nuclear Spectroscopy held in Tbilisi in Feb. 1964]

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 5-18

TOPIC TAGS: gas filled counter, electron counter, radon, tritium

ABSTRACT: The authors review methods of designing gas-filled radiation counters and their basic characteristics. The attention is primarily focused on the low-noise aspects of the design and operation. The basic theory of noise level in the counters is briefly reviewed and minimum measurable intensity is given. This quantity is given in terms of the number of noise-inducing events such as cosmic rays and others. The materials used in the construction of the counters are evaluated in terms of their radioactivity level arising from the presence of α, β, γ-active impurities. Tables are given listing various materials used in counters and the number of radiation events per 100 cm^2 per hour. Chemical affinity and abundance of radioactive elements in various materials, their decay times and other particulars are discussed. Next, the gas used for filling the counter is evaluated, mainly in terms of impurities in such elements

UDC: 621.387.4

Card 1/2

ACC NR: AP6034225 SOURCE CODE: UR/0120/66/000/005/0095/0096

AUTHOR: Viktorov, S. V.; Kocharov, G. Ye.; Naydenov, V. O.

ORG: Physico-technical Institute, Academy of Sciences, SSSR, Leningrad (Fiziko-tekhnicheskiy institut AN SSSR)

TITLE: Background characteristics of some industrial gas-filled counters

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1966, 95-96

TOPIC TAGS: scintillation counter, scintillation detector, radiation detecting device, GAS FILLED COUNTER

ABSTRACT: Results of background noise investigation of lot produced MST-17, SI-2B, STS-6, STS-8, MS-11, and MSTR-4 type industrial counters are presented. Measurements were made without protection and with passive, active, or passive plus active protection. The passive protection consisted of an iron screen 15 cm thick, the active protection was represented by a plastic scintillation detector tuned as an anticoincidence circuit with the investigated counter. The counter was placed in a pit drilled along the scintillator axis. Results permitted evaluation of protection with and without passive shielding. There were 2—3 more pulses per min for the share with the active protection, which excludes the hard component of cosmic radiation and partially absorbs the soft component. Radiation from radioactive substances in surrounding objects is also absorbed. Experiments demonstrated that the use of protective (passive) screens reduces background noise 3 to 4 times; a further

Card 1/2 UDC: 621.387.4

ACC NR: AP6034225

reduction by a factor of 1.5—2.5 can be obtained by using additional active protection. Orig. art. has: 2 tables.

SUB CODE: 18/ SUBM DATE: 30Aug65/ ORIG REF: 002/ OTH REF: 005/

Card 2/2

KOCHAROV, N., komandir podrazdeleniya.

Masters of aeronautical work. Grazhd.av.13 no.7:5 Jl '56.
(Aeronautics in agriculture) (MLRA 9:9)

KOCHAROV, N.

The Republic of Mali finds its wings! Grazhd. av. 19 no.6:
16 Je '62. (MIRA 18:6)

KOCHAROV, N.

Air bases for agricultural work. Grazhd.av. 18 no.5:7-8 My '61.
(MIRA 14:5)
(Aeronautics in agriculture)